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## (54) QUICK CONNECTOR WITH INTEGRAL RELEASE MEMBER

SCHNELLKUPPLUNG MIT EINEM INTEGRIERTEN ENTSTEGELUNGSELEMENT

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male connector part.

[0012] A plurality of axial slots extend from one end to an opposite end of the outer sleeve and divide the outer sleeve into a plurality of circumferential spaced portions, each integrally joined at one end to the inner sleeve.

[0013] The release means further comprises a plurality of fingers extending axially from one end of the inner sleeve and slidably disposed between adjacent deflectable legs of the retainer mounted in the bore of the female connector part.

[0014] The means for retaining the release means in the housing of the female connector part preferably comprises a plurality of radially extending projections formed on the inner sleeve and extending outward toward the outer sleeve. The projections extend radially outward a distance greater than the inner diameter of the open end of the bore in the female connector part to engage an inward extending flange formed on the end of the female connector part. Preferably, the slots in the outer sleeve are circumferentially aligned with the fingers and the projections on the inner sleeve.

[0015] The release means of the present invention provides an easily grippable and manipulatable surface which enables a user to easily grasp and urge the release means into the bore in the female connector part to permit separation of the male conduit from the female connector part even in crowded or limited space conditions. The present release means eliminates the need for a separate release tool as employed in certain previous quick connector designs. Further, the release means is non-releasably connected to the female connector component thereby eliminating the need for a separate release member slidably mounted on the male conduit as in certain other prior art quick connector designs. This enables the release means and the female connector part to be constructed as a single unit to thereby reduce the number of separate components required in the quick connector. Further, once the release means is mounted in the female connector part of the quick-type connector, it remains secured to the female connector part so as to prevent any inadvertent loss or separation therefrom.

#### BRIEF DESCRIPTION OF THE DRAWING

[0016] The various features, advantages and other uses of the present invention will become more apparent by referring to the following detailed description and drawing in which:

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nector part employed in a quick connector showing the mounting of the release member depicted in Fig. 2 thereon;

Fig. 5 is a partial, cross sectional view, showing the position of the various components of the quick connector and the release member in their normal position when a male conduit is coupled to the female connector part; and

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#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] Referring now to the drawing, and to Fig. 1 in particular, there is depicted a prior art release member 10 similar to the release members shown in United States Patent Nos. 5,056,756 and 5,161,834. The release member 10 includes a cylindrical tubular body 12 having a through bore 14 extending therethrough. An enlarged end flange 16 is formed at one end of the tubular body 12 and extends radially outward therefrom.

A plurality of slots 18 are formed in the end flange 16. [0018] A plurality of axially extending fingers 20 project from the opposite end of the tubular body 12 and are adapted to slide between the deflectable legs of a retaining member typically employed in quick-type connectors. Retainer engaging surfaces 22 are formed on one end of the tubular body 12 in between the axially extending fingers 20. The surfaces 22 engage the deflectable legs of the retainer member in a female connector part when the tubular body 12 is slidably urged into the female connector part and cause the deflectable

legs of the retainer to expand radially outward to enable an enlarged annular flange formed on a male conduit to be easily slid past the retaining member and be separated from the female connector part. Lock projections 24 are formed on the exterior surface of the tubular body 12 for engaging a rolled-in end flange on the female connector part to retain the tubular body 12 within the female connector part.

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The remainder of the axial length of the outer sleeve 32 is spaced from the inner sleeve 34 by an annular recess 42 such that a second end 44 of the outer sleeve 32 is

male connector part.

[0012] A plurality of axial slots extend from one end to an opposite end of the outer sleeve and divide the outer sleeve into a plurality of circumferential spaced portions, each integrally joined at one end to the inner sleeve.

[0013] The release means further comprises a plurality of fingers extending axially from one end of the inner sleeve and slidably disposed between adjacent deflectable legs of the retainer mounted in the bore of the female connector part.

[0014] The means for retaining the release means in the housing of the female connector part preferably comprises a plurality of radially extending projections formed on the inner sleeve and extending outward toward the outer sleeve. The projections extend radially outward a distance greater than the inner diameter of the open end of the bore in the female connector part to engage an inward extending flange formed on the end of the female connector part. Preferably, the slots in the outer sleeve are circumferentially aligned with the fingers and the projections on the inner sleeve.

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nector part employed in a quick connector showing the mounting of the release member depicted in Fig. 2 thereon;

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est montée dans le perçage (66) et s'applique contre une surface de butée radiale (88) située sur une partie mâle (80) du raccord, qui peut être insérée dans le perçage (66) pour retenir la partie mâle (80) du raccord dans le boîtier (62), comportant un élément de libération (30) pourvu d'un manchon intérieur tubulaire (34) possédant une extrémité et une extrémité opposée et comprenant un manchon extérieur (32) réuni d'un seul tenant à une extrémité du manchon intérieur (34) et s'étendant concentriquement par ce dernier, le manchon extérieur (32) étant disposé à l'extérieur de l'extrémité tubulaire du boîtier (62) lorsque l'élément de libération (30) est monté dans le boîtier (62) et au moins une surface (70) d'engagement avec la branche de retenue, formée sur le manchon intérieur (34) et pouvant engrainer avec une branche (82) apte à fléchir de l'organe de retenue lors d'un déplacement axial de l'élément de libération dans le perçage (66) présent dans le boîtier (62) de manière à déformer radialement vers l'extérieur la au moins une branche (82) apte à fléchir, sur une distance suffisante pour permettre à la surface de butée radiale (88) présente sur la partie mâle (80) du raccord de se dégager de l'organe de retenue (72) et de se séparer du boîtier (62), et des moyens (64), qui s'étendent à travers le perçage (66), sont formés sur le manchon intérieur (34) et coopèrent avec le boîtier (62) pour retenir l'élément de libération (30) dans le perçage (66) présent dans le boîtier (62) et possédant une surface externe pouvant être saisie avec les doigts et formée sur le manchon extérieur (32), caractérisé par une pluralité de fentes (48) qui s'étendent axialement depuis une extrémité jusqu'à une extrémité opposée du manchon extérieur (32) et divisent le manchon extérieur (32) en une pluralité de sections (32A, 32B, 32C, 32D) du manchon extérieur, qui sont espacées circonférentiellement et sont réunies chacune d'un seul tenant, par une extrémité, au manchon intérieur (34).

2. Organe de libération selon la revendication 1, comprenant en outre une pluralité de doigts (52) qui s'étendent axialement à partir de l'extrémité opposée du manchon intérieur (34).
3. Organe de libération selon la revendication 1 ou 2, dans lequel les moyens pour retenir l'organe de libération (30) dans le boîtier (62) comprennent une pluralité de parties saillantes (54) distantes circonférentiellement, qui s'étendent radialement vers l'extérieur et sont formées sur le manchon intérieur (34), les parties saillantes (54) s'étendant radialement vers l'extérieur sur une distance supérieure à un diamètre de l'extrémité ouverte (64) du perçage (66) formée dans le boîtier (62).
4. Organe de libération selon la revendication 2, ca-

ractérisé en ce que les fentes (48) formées dans le manchon extérieur (32) sont alignées axialement avec les doigts (52) situés sur le manchon intérieur (34).

5. Organe de libération selon l'une quelconque des revendications précédentes, dans lequel la surface extérieure (33) du manchon extérieur (32) possède une forme courbe en renforcement, qui permet l'en-gagement d'un doigt.
6. Raccord fluidique de type rapide comprenant un boîtier (62) possédant une extrémité tubulaire et un perçage (66) qui traverse cette extrémité à partir d'une extrémité ouverte (64) du boîtier (62), un conduit (80) pouvant être inséré dans le perçage (66), le conduit (80) possédant une bride annulaire (88) qui s'étend radialement vers l'extérieur et est dis-tante d'une extrémité du conduit, un organe de retenue (72) monté dans le perçage (66) formé dans le boîtier (62), l'organe de retenue (72) possédant une pluralité de branches (84) aptes à fléchir qui sont espacées circonférentiellement et comportent des extrémités extérieures axiales (86) distantes d'un épaulement intermédiaire présent dans le perçage (66) de manière à former une ouverture servant à recevoir la bride annulaire (88) située sur le conduit (80) selon un engagement de blocage avec les extrémités axiales des branches (84) aptes à flé-chir, un diamètre intérieur entre des extrémités axiales extérieures opposées des branches aptes à fléchir (84) étant un premier diamètre nominal in-férieur au diamètre extérieur de la bride annulaire radiale (88) présente sur le conduit (80), des moyens de libération (30) montés dans le perçage (66) du boîtier (62) dans l'extrémité ouverte de ce dernier, des moyens formés sur les moyens de li-bération (30) et coopérant avec une bride intérieure rentrante (60) présente sur le boîtier (62) pour retenir les moyens de libération (30) dans le boîtier (62), et les moyens de libération (30) comprenant un manchon intérieur (34) pourvu d'un perçage (50) traversant ce manchon et possédant un diamètre intérieur inférieur au diamètre intérieur nominal en-tre des branches opposées aptes à fléchir (84) du dispositif de retenue (72), un manchon extérieur (32) réuni d'un seul tenant au manchon intérieur (34), à une extrémité, et s'étendant concentrique-ment par dessus le manchon intérieur (34) à partir de cette extrémité, le manchon extérieur (32) étant disposé de manière à pouvoir glisser sur l'extrémité tubulaire (63) du boîtier (62), une pluralité de doigts (52) qui font saillie axialement à partir d'une extrémité (46) du manchon intérieur (34) à l'opposé de l'extrémité (40) de ce dernier, les doigts (52) étant disposés entre deux branches adjacentes aptes à fléchir (84) du dispositif de retenue (72), des surfa-ces (70) d'engagement des branches du dispositif

de retenue étant formées sur une extrémité du manchon intérieur (34) entre les doigts (52), et une surface (33) pouvant être manipulée par l'utilisateur et formée extérieurement sur le manchon extérieur (32) de manière à permettre à l'utilisateur de saisir et de repousser par glissement les moyens de libération (30) en direction de l'intérieur du perçage (66) formé dans le boîtier (62) de telle sorte que les surfaces (70) d'engagement des branches de retenue du dispositif de retenue, qui sont présentes sur le manchon intérieur (34), coopèrent avec et font dévier les branches aptes à fléchir (84) du dispositif de retenue (72) radialement vers l'extérieur jusqu'à un diamètre entre des branches aptes à fléchir opposées (84), qui est supérieur au diamètre extérieur de la bride annulaire (88) présente sur le conduit (80) en permettant la séparation du conduit (80) par rapport au boîtier (62), et comprenant en outre une pluralité de fentes (48) qui s'étendent axialement à partir de l'extrémité (36) en direction d'une pluralité de fentes (48) qui s'étendent axialement à partir de l'extrémité (36) jusqu'à une extrémité opposée (44) du manchon extérieur (32) et subdivisant le manchon extérieur (32) en une pluralité de sections extérieures de manchon (32A,32B,32C,32D), qui sont espacées circonférentiellement et dont chacune est réunie d'un seul tenant, à une extrémité (40), au manchon intérieur (34).

7. Raccord rapide selon la revendication 6, dans lequel les fentes (48) formées dans le manchon extérieur (32) sont alignées circonférentiellement avec les doigts (52) situés sur le manchon intérieur (34). 30

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8. Raccord rapide selon la revendication 6 ou 7, dans lequel les moyens de montage des moyens de libération (30) dans le boîtier (62) comprennent une pluralité de parties saillantes (54), qui font saillie radialement, sont espacées circonférentiellement et sont formées sur le manchon intérieur (34), les parties saillantes (34) s'étendant radialement vers l'extérieur sur une distance telle qu'un diamètre extérieur entre les parties saillantes opposées (54) est supérieur à un diamètre de l'extrémité ouverte (64) du perçage (66) formé dans le boîtier (62). 40 45

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